

Remarks

The Office action mailed January 14, 2004, has been reviewed and carefully considered. The Office action notes that the original set of claims did not include a claim number 44. The lack of a claim 44 is due to inadvertent miss-numbering of the claims. Accordingly, original claims 45-86 have been cancelled and new claims 87-123 have been substituted for these original claims. New claims 87-108 track original claims 45-66, original claim 67 is not presented as a new claim, new claims 109-112 track original claims 68-71, original claim 72 is not presented as a new claim, new claims 113-119 track original claims 73-79, original claim 80 is not presented as a new claim, new claims 120-122 track original claims 81-83, original claims 84 and 85 have not been presented as new claims, and new claim 123 tracks original claim 86. Claims 1, 3, 9, 12, 13, 24, 25, 27, 29, 31, 38, and 39 have been amended for purposes not related to patentability. Claim 2 has been amended to address objections raised by the examiner. New claim 106 (original claim 64) incorporates the subject matter of original claim 67. New claim 112 (original claim 71) incorporates the subject matter of original claim 72. New claim 118 (original claim 78) incorporates the subject matter of claim 80. New claims 124-136 also have been added. New claim 124 recites the subject matter of original dependent claim 70 in independent form. New claim 125 recites the subject matter to original dependent claim 86. New claims 126-134 find support in the specification at page 9, lines 20-22. New claims 135-136 find support throughout the specification. Page 20, line 8, of the specification has been amended to correct an inadvertent error. Support for this amendment is found, for example, at page 19, lines 22-23. Entry of these amendments is respectfully requested.

Drawings

The Office action notes that FIGS. 1-5B do not include reference numeral "208" that was mentioned on page 20, line 8, of the specification. The designation of "adsorber wheel 208" was an inadvertent error. The specification has now been amended to correctly state "rotor 4." Accordingly, there is no need to correct the drawings with respect to this item.

The Office action further indicates that reference numerals "105", "106", "132", and "180" that appear in FIG. 1 are not mentioned in the specification. Reference numeral "105" in

FIG. 1 has been corrected to reference numeral "107". Reference numerals "106" and "107" designate circumferential seals as stated on page 25, lines 19-20, of the specification. Reference numeral "132" designates a circumferential seal as stated on page 27, line 20, of the specification. Reference numeral "180" designates a stator housing member as stated on page 28, line 27, of the specification.

Claim Objections

Claim 2 has been amended, and original claim 64 (now claim 106) has been corrected. As mentioned above, the miss-numbered claims have been replaced with new claims.

35 U.S.C. §112, second paragraph, Rejections

The examiner has rejected several claims based on alleged indefiniteness from improper Markush language. However, there is nothing in §112, second paragraph, that requires the use of "selected from the group consisting of" for Markush language. MPEP §2173.05(h) indicates that alternative language such as "wherein R is A, B, C or D" is also acceptable. Accordingly, the pending §112, second paragraph rejections should be reconsidered and withdrawn.

New claim 103 (original claim 61) deletes "coolant" to provide proper antecedent basis.

35 U.S.C. §102(e) Rejection over Gittleman et al.

Original claims 1-28, 31-43, and 45-56 have been rejected under §102(e) over Gittleman et al. (US 2002/0110503). The Gittleman et al. application has an effective §102(e) date of February 9, 2001. The present application claims priority to Canadian patent applications 2,324,699 titled "Carbon Monoxide Removal from Hydrogen Feed to Fuel Cell" ("the '699 application") and 2,324,702 titled "Reformate Purification and Heat Recovery from Fuel Cell" ("the '702 application"), both of which were filed on October 27, 2000. Certified copies of the Canadian priority applications have been received by the U.S. Patent and Trademark Office as noted in the Office Action Summary. The priority date of the present application, October 27, 2000, is earlier than the February 9, 2001 effective §102(e) date of Gittleman et al. Hence, the

§102(e) rejection over Gittleman et al. must be withdrawn if the Canadian priority applications support the rejected claimed subject matter (see MPEP §706.02(b)).

To this end, rejected original claims 1-28, 31-43, and 45-56 (now claims 87-98) are supported, for example, in the Canadian priority applications as follows (support is in the '699 application unless indicated otherwise):

Claim 1 - page 4, lines 16-17 (hydrogen feed to fuel cell anode); page 6, lines 16-22 (hydrogen feed that includes at least one contaminant); page 9, lines 11-30 (first adsorbent and second adsorbent); page 11, line 24 - page 12, line 16 (first adsorbent and water gas shift catalyst) (Gittleman et al. does not disclose a steam reforming catalyst);
Claims 2, 3, 37 and 38 - page 7, lines 24-28; page 9, lines 18-29;
Claim 4 - page 7, lines 14-17;
Claims 5, 20, 21 and 40 - page 9, lines 18-29; page 26, lines 6-11;
Claims 6, 33 and 54 - page 4, lines 27 - 32; page 26, lines 5-6;
Claims 7 and 19 - page 24, lines 13-18;
Claims 8, 18, 32 and 52 - page 5, lines 1-6;
Claims 9, 26, 28, 43, 50 and 56 - page 7, lines 24-27;
Claims 10 and 41 - page 11, lines 24-29;
Claim 11 - Gittleman et al. does not disclose "alkali-promoted material";
Claim 12 - Gittleman et al. does not disclose a steam reforming catalyst;
Claims 13, 24 and 27 - page 4, lines 16-17 (hydrogen feed to fuel cell anode); page 6, lines 16-22 (hydrogen feed that includes at least two contaminants); page 9, lines 11-30 (first separation zone and second separation zone, separating first contaminant in first separation zone, separating second contaminant in second separation zone);
Claims 14, 15 and 17 - page 9, lines 18-24;
Claim 16 - page 26, lines 6-11;
Claims 22 and 45 - page 9, line 18 - page 10, line 12;
Claim 23 - page 11, lines 15-17;
Claim 25 - page 4, lines 16-17 (hydrogen feed to fuel cell anode); page 5, lines 1-11 (hydrogen feed that includes CO); page 9, lines 26-29 and page 10, lines 4-12 (recited adsorbents); page 4, lines 27 - 32 and page 26, lines 5-6 (rotary PSA);

Claim 31 - page 5, lines 1-11 (hydrogen-containing gas source); page 9, lines 11-30 (first adsorbent and second adsorbent); page 11, line 24 - page 12, line 16 (first adsorbent and water gas shift catalyst) (Gittleman et al. does not disclose a steam reforming catalyst); page 4, lines 16-17 (hydrogen feed to fuel cell anode);
Claims 34, 35 and 53 - page 9, lines 11-16;
Claim 36 - page 4, lines 16-19; page 6, lines 22-25;
Claim 39 - page 11, lines 10-17;
Claim 42 - Gittleman et al. does not disclose "alkali-promoted material";
Claim 46 - page 7, lines 24-28;
Claims 47 and 48 - page 27, line 9 - page 28, line 5 of the '702 application;
Claim 49 - page 5, lines 1-11 (hydrogen-containing gas source); page 7, lines 24-28 (CO-selective adsorbent); page 4, lines 16-17 (hydrogen feed to fuel cell anode);
Claim 51 - page 6, lines 16-22 (hydrogen feed that includes at least two contaminants); page 9, lines 11-30 (first separation zone and second separation zone); page 4, lines 16-17 (hydrogen feed to fuel cell anode); and
Claim 55 - page 5, lines 1-11 (hydrogen-containing gas source); page 9, lines 26-29 and page 10, lines 4-12 (recited adsorbents); page 4, lines 27 - 32 and page 26, lines 5-6 (rotary PSA); page 4, lines 16-17 (hydrogen feed to fuel cell anode).

Based on the foregoing, the pending §102(e) rejection of claims 1-28, 31-43, and 45-56 (now claims 87-98) over Gittleman et al. must be withdrawn.

35 U.S.C. §102(e) Rejection over Towler et al.

Original claims 29, 30 and 57 (now claim 99) stand rejected under §102(e) over Towler et al. The Towler et al. publication has an effective §102(e) date of December 8, 2000. As discussed above, the present application has a priority date of October 27, 2000. The priority date of the present application, October 27, 2000, is earlier than the December 8, 2000 effective §102(e) date of Towler et al. Hence, the §102(e) rejection over Towler et al. must be withdrawn if the Canadian priority applications support the rejected claimed subject matter (see MPEP §706.02(b)). Support for original claims 29, 30 and 57 (now claim 99) is found in the '702

application, for example, at page 25, line 15 - page 27, line 7. Accordingly, the pending §102(e) rejection over Towler et al. must be withdrawn.

35 U.S.C. §102(b) over JP 6334862 (Matsumoto et al.)

Original claims 64, 65, 66, 69, 70, 78, 79, 85 and 86 were rejected under §102(b) over JP 6334862 (Matsumoto et al.). This rejection is traversed for the reasons stated below.

The process of claim 106 (original claim 64) includes purifying the hydrogen-containing gas stream prior to introducing the stream into the anode inlet. This feature was previously recited in dependent claim 67. Recognizing that Matsumoto et al. does include such a purification, the examiner relies upon Towler et al. to supply this missing feature in rejecting claim 67 under §103. However, claim 106 is supported in the '702 application at page 29, line 9 – page 30, line 9 and FIG. 8. Thus, Towler et al. is not prior art with respect to claim 106. The obviousness rejection of the subject matter of claim 67 (now recited in claim 106) cannot be maintained since Towler et al. is not prior art.

Original dependent claim 70 has been rewritten as new independent claim 124. The cathode exhaust in the Matsumoto et al. system as described in the abstract appears to be simply exhausted to the ambient atmosphere. In contrast, the process of claim 124 includes condensing at least a portion of the cathode water vapor and separating the resulting liquid stream from the cathode exhaust stream. Thus, Matsumoto et al. does not anticipate claim 124.

The system of claim 118 (original claim 78) includes a pressure swing adsorption module. This feature was previously recited in dependent claim 80. Recognizing that Matsumoto et al. does not include a pressure swing adsorption module, the examiner relies upon Towler et al. to supply this missing feature in rejecting claim 80 under §103. However, claim 118 is supported in the '702 application at page 29, line 9 – page 30, line 9 and FIG. 8. Thus, Towler et al. is not prior art with respect to claim 118. The obviousness rejection of the subject matter of claim 80 (now recited in claim 118) cannot be maintained since Towler et al. is not prior art.

Original dependent claim 86 has been rewritten as new independent claim 125. As noted above, the cathode exhaust in the Matsumoto et al. system as described in the abstract appears to be simply exhausted to the ambient atmosphere. In contrast, the system of claim 125 includes a

separator for separating water from the cathode exhaust stream. Thus, Matsumoto et al. does not anticipate claim 125.

35 U.S.C. §102(b) Rejection over EP 751045 (Abersfelder et al.)

Original claims 71 and 77 have been rejected under §102(b) over Abersfelder et al. Claim 112 (original claim 71) has been amended to include a pressure swing adsorption module (previously recited in claim 72). Recognizing that Abersfelder et al. does not include such a pressure swing adsorption module, the examiner relies upon Gittleman et al. to supply this missing feature in rejecting claim 72 under §103. However, claim 112 is supported in the '702 application at page 29, line 9 – page 30, line 9 and FIG. 8. Thus, Gittleman et al. is not prior art with respect to claim 112. The obviousness rejection of the subject matter of claim 72 (now recited in claim 112) cannot be maintained since Gittleman et al. is not prior art.

35 U.S.C. §103 Rejection over Matsumoto et al. combined with Towler et al.

Original claims 67, 68, 80, 82 and 84 were been rejected under §103 over Matsumoto et al. combined with Towler et al. The subject matter of original claims 67 and 80 has been incorporated into claims 106 and 118, respectively, as explained above. The subject matter of claims 109 (original claim 68), and 122 (original claim 82) also is supported in the '702 application at page 29, line 9 – page 30, line 9 and FIG. 8. Towler et al. is not prior art to these claims, and thus the §103 rejection must be withdrawn.

35 U.S.C. §103 Rejection over Abersfelder et al. combined with Gittleman et al.

Original claims 72 and 73 stand rejected under §103 over Abersfelder et al. combined with Gittleman et al. The subject matter of claim 72 has been incorporated into claim 112, as explained above. The subject matter of claim 113 also is supported in the '702 application at page 29, line 9 – page 30, line 9 and FIG. 8. Gittleman et al. is not prior art to these claims, and thus the §103 rejection must be withdrawn.

35 U.S.C. §103 Rejection over Matsumoto et al. combined with Towler et al. and Gittleman et al.

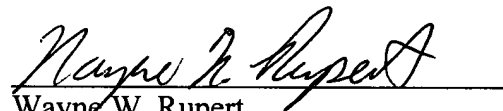
Original claims 81 and 83 were rejected under §103 over Matsumoto et al. combined with Towler et al. and Gittleman et al. The subject matter of claims 120 and 122 (original claims 81 and 83) is supported in the '702 application at page 29, line 9 – page 30, line 9 and FIG. 8. Neither Gittleman et al. nor Towler et al. is prior art to these claims, and thus the §103 rejection must be withdrawn.

It is respectfully submitted that the application is in condition for allowance. Should there be any questions regarding this application, Examiner Medina is invited to contact the undersigned attorney at the telephone number shown below.

Respectfully submitted,

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FIG. 1

